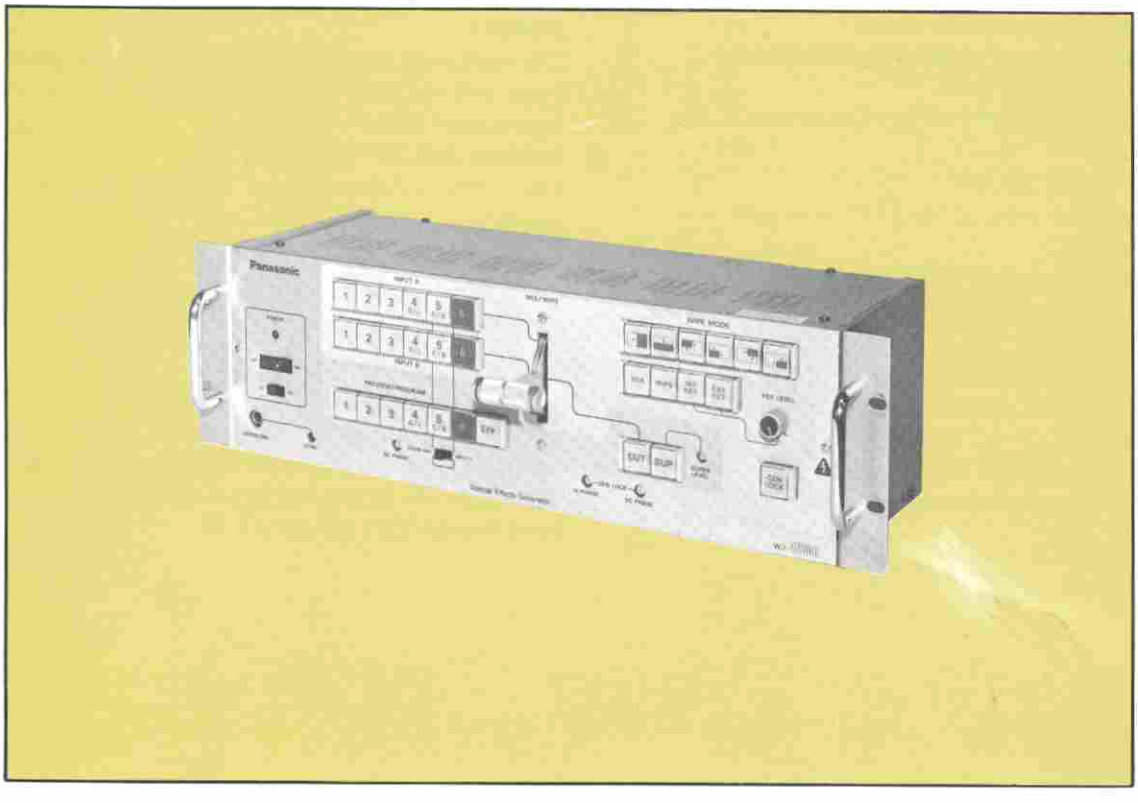
# Operating Instructions

**Special Effects Generator**

## WJ-4600C



**Panasonic**

Before attempting to connect or operate this product, please read these instructions completely.

# CONTENTS

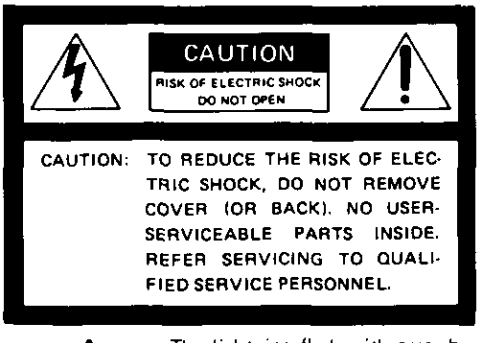

PREFACE ..... 1
FEATURES ..... 1
MAJOR OPERATING CONTROLS ..... 2
CONTROLS AND THEIR FUNCTIONS ..... 3
SYSTEM CONNECTION ..... 5
SET UP PROCEDURE ..... 7
OPERATION ..... 9
TALLY AND INTERCOM CONNECTIONS ..... 11
EXTERNAL DC INFORMATION ..... 11
SPECIFICATIONS ..... 12
STANDARD ACCESSORIES ..... 13

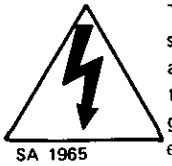

## PREFACE

The Panasonic color special effects generator, model WJ-4600C has many features such as an internal sync generator with genlock capability, color bar generator, vertical interval switching and internal and external keying. A separate sync generator is no longer required. When using this SEG with any new Panasonic color camera, no external subcarrier phase shifter is needed. Other features include non-locking pushbuttons that light up when pressed to indicate input, and lock-release buttons that light up when pressed to indicate function. The WJ-4600C can mix composite and non-composite video inputs. The WJ-4600C has one preview output, one effects output, three black burst outputs, and two program outputs; it also supply intercom power and tally light switching to cameras.

The WJ-4600C is ideal for small color studios in business, education, or CATV, and very compact for easy mobility in a portable studio.

The WJ-4600C has EXT DC input for outdoor use portable switcher.


CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN
CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK, DO NOT REMOVE COVER (OR BACK). NO USER-SERVICEABLE PARTS INSIDE. REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.



SA 1965

The lightning flash with arrowhead symbol, within an equilateral triangle, is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

## FEATURES

1. Inputs:
   6 program inputs, 1 super input, 1 external key (monochrome) input.
2. Functions:
   Vertical interval switching. Fades and lap-dissolves. Six wipe patterns. Super Internal and external key.
3. Non-locking pushbuttons light up when pressed to show inputs and selected functions.
4. "CUT" pushbutton transfers program and preview buses.
5. Built-in sync and color bar generator:
   Genlock circuits, Color bar generator. Front panel SC phase and H. phase adjustments for genlock, and SC phase adjustment for color bars.
6. Accepts composite or non-composite inputs.
7. BNC connectors.
8. Effects, Preview, and two program outputs.
9. Supplies intercom power to six cameras.
10. Supplies tally light on/off switching of all eight inputs.
11. Adjustable intercom level.
12. Requires just 5-1/4" of standard EIA rack space.
13. AC or DC power operation available.
14. Can be put into optional carrying case for hand-carry transportation.

SA 1966

The exclamation point within an equilateral triangle is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

**Warning :**

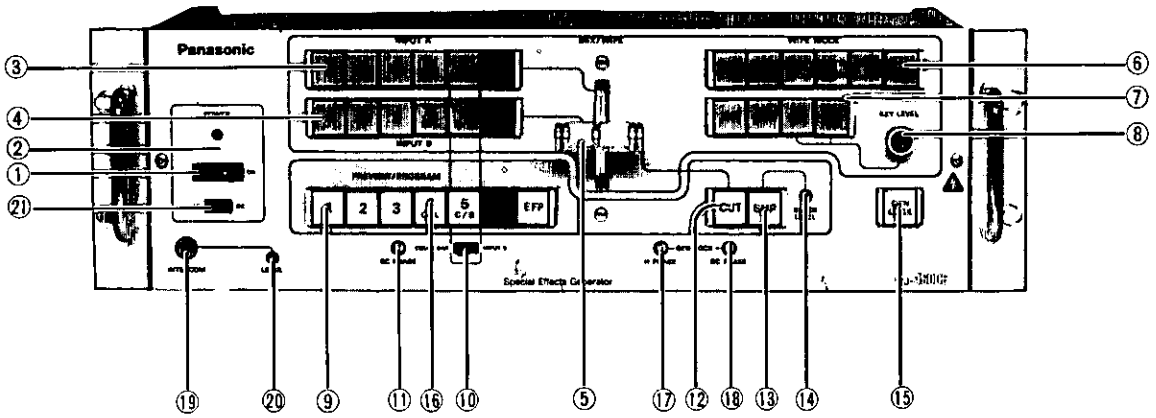
**This equipment generates and uses radio frequency energy and if not installed and used properly, i.e., in strict accordance with the instructions manual, may cause harmful interference to radio communications.**

**It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment.**

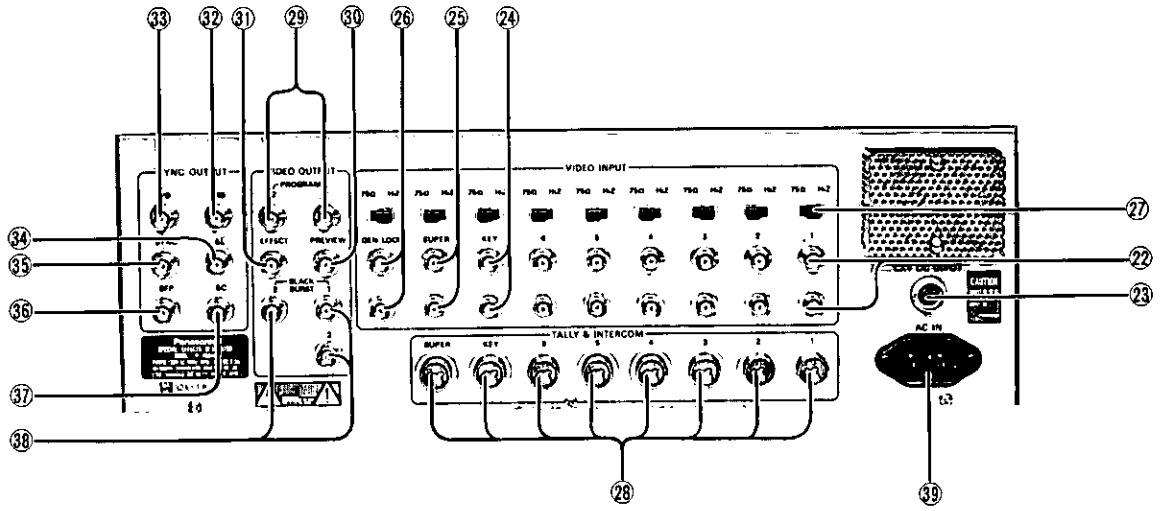
**WARNING: TO PREVENT FIRE OR SHOCK HAZARD, DO NOT EXPOSE THIS APPLIANCE TO RAIN OR MOISTURE**

# MAJOR OPERATING CONTROLS

- FRONT VIEW




- REAR VIEW



# CONTROLS AND THEIR FUNCTIONS

## FRONT

① **ON/OFF Switch [ POWER ON/OFF ]**

② **Pilot Lamp**

③ **Input A Selector [ INPUT A ]**
Selects any one of 6 video sources for input A

CAUTION Preview monitor will show the black & white picture when the black & white signal or no signal is selected on CH A (Input A)
It is recommended that the color signal for CH A should be selected for color preview monitor

④ **Input B Selector [INPUT B]**
Selects any one of 6 video sources for input B

⑤ **Mix and Wipe Levers [MIX/WIPE]**
Separate or locked, dual-fader and split screen controls

⑥ **Wipe Mode Selector [ WIPE MODE ]**
Pushing any one of the six wipe mode selector buttons selects the wipe pattern and enables the Mix and Wipe Levers ⑤

⑦ **Function Selector [ MIX/WIPE/INT KEY/EXT KEY]**
Selects the type of special effect which is applied to the program out bus

⑧ **Key Level Control [ KEY LEVEL ]**
Control for obtaining optimum keying

⑨ **Preview/Program Selector [ PREVIEW/PROGRAM]**
Cut ON/OFF Switch ⑫ **OFF**
Permits the preview video (1~6, EFF) to be seen in the preview monitor
Cut ON/OFF Switch ⑫, **ON**
Permits the preview video (1~6, EFF) to be seen as a program (line out)

⑩ **Color Bar/Camera Selector [ COLOR BAR/CAMERA]**
Set this selector to COLOR BAR position when adjusting a color monitor

⑪ **Subcarrier Phase Control [ SC PHASE]**
The recessed control adjusts the phase of the subcarrier for color bar

⑫ **Cut ON/OFF Switch [CUT ]**
Reverses the preview and program buses when ON

⑬ **Super ON/OFF Switch [ SUP ]**
Permit superimposing of images when ON

⑭ **Super Level Control [ SUPER LEVEL ]**
Control for obtaining optimum superimposed image

⑮ **Gen-lock ON/OFF Switch [ GEN LOCK ]**
Gen-lock video input signal should be connected to the Video Input Connector for Gen-lock ㉖ When the gen lock signal is connected, and this switch is pushed in, the lamp will light It will stay off otherwise

⑯ **Gen-lock Push Button [ 4 G/L ]**
Gen lock Switch **ON**
The video signal which is connected to the Video Input Connector for Gen lock ㉖ will be selected by depressing the No 4 (G/L) button of input selector
Gen-lock Switch **OFF**
The video signal which is connected to the No 4 of Video Input Connector ㉒ will be selected by depressing the No 4 (G/L) button of input selector

⑰ **SC Phase Control for Gen-lock [GEN LOCK SC PHASE ]**
This recessed control is need to match the color hues between the gen-lock signal and the program output
See page 7

⑱ **Horizontal Phase Control for Gen-lock [ GEN LOCK H PHASE ]**
The horizontal phase difference between the gen-lock signal and the program output may be adjusted with this recessed control
See page 7

⑲ **Intercom Jack [ INTERCOM ]**
For voice communications between cameras and WJ-4600C

⑳ **Intercom Level Control [LEVEL]**
Turn this control to have optimum sound level for headset connecting to the intercom jack ⑲

㉑ **AC/DC Switch (AC/DC)**
This is AC or DC power selector switch
Set this switch to AC side when 120V AC 60Hz power is supplied through AC power supply connector ㊴
Set this switch to DC side when 12V DC power is supplied through EXT DC INPUT ㉓

## REAR

㉒ **Video Input Connector [ VIDEO INPUT 1～6 ]**
The output of a remote control unit should be connected to one of these two BNC connectors. If this signal is not looped through, the Video Termination Switch ㉗ should be set to 75Ω position.

㉓ **External DC Input Connector (EXT DC INPUT)**
Four pin type connector for external 12V DC 1.2A source.

㉔ **Video Input Connector for Key [ VIDEO INPUT/KEY ]**
The output of the key camera should be connected to one of these two BNC connectors. If this signal is not looped through, the Video Termination Switch ㉗ should be set to 75 Ω position.

㉕ **Video Input Connector for Superimposing [ VIDEO INPUT/SUPER ]**
The output of the camera used for superimposing should be connected to one of these two BNC connectors. If this signal is not looped through, the Video Termination Switch ㉗ should be set to 75Ω position.

㉖ **Video Input Connector for Gen-lock [ VIDEO INPUT /GEN LOCK ]**
The output of a non-synchronous composite video source should be connected to one of these two BNC connectors. If this signal is not looped through, the Video Termination Switch ㉗ should be set to 75Ω position.

㉗ **Video Termination Switch [ VIDEO INPUT 75 Ω/Hi-Z ]**
When bridging or looping through, set this switch to Hi-Z position. Set to 75Ω position otherwise.

㉘ **Tally Intercom Connector [ TALLY/INTERCOM ]**
The output of the remote control unit is introduced into this connector.

㉙ **Program Output Connector [ VIDEO OUTPUT PROGRAM 1-2 ]**
There are two program outputs available, both using BNC type connectors.

㉚ **Preview Output Connctor [ VIDEO OUTPUT /PREVIEW ]**
BNC type connector for preview output.
CAUTION: Preview monitor will show the black & white picture when the black & white signal or no signal is selected on CH A (Input A).
It is recommended that the color signal for CH A should be selected for color preview monitor.

㉛ **Effects Output Connector [ VIDEO OUTPUT/EFFECT ]**
BNC type connector for effects output.

㉜ **Horizontal Drive Output Cnnector [ SYNC OUTPUT /HD ]**
BNC type connector for HD signal.

㉝ **Vertical Drive Output Connector [ SYNC OUTPUT/VD ]**
BNC type connector for VD signal.

㉞ **Blanking Output Connector [ SYNC OUTPUT/BL ]**
BNC type connector for BL signal.

㉟ **Sync Output Connector [ SYNC OUTPUT/SYNC ]**
BNC type connector for SYNC signal.

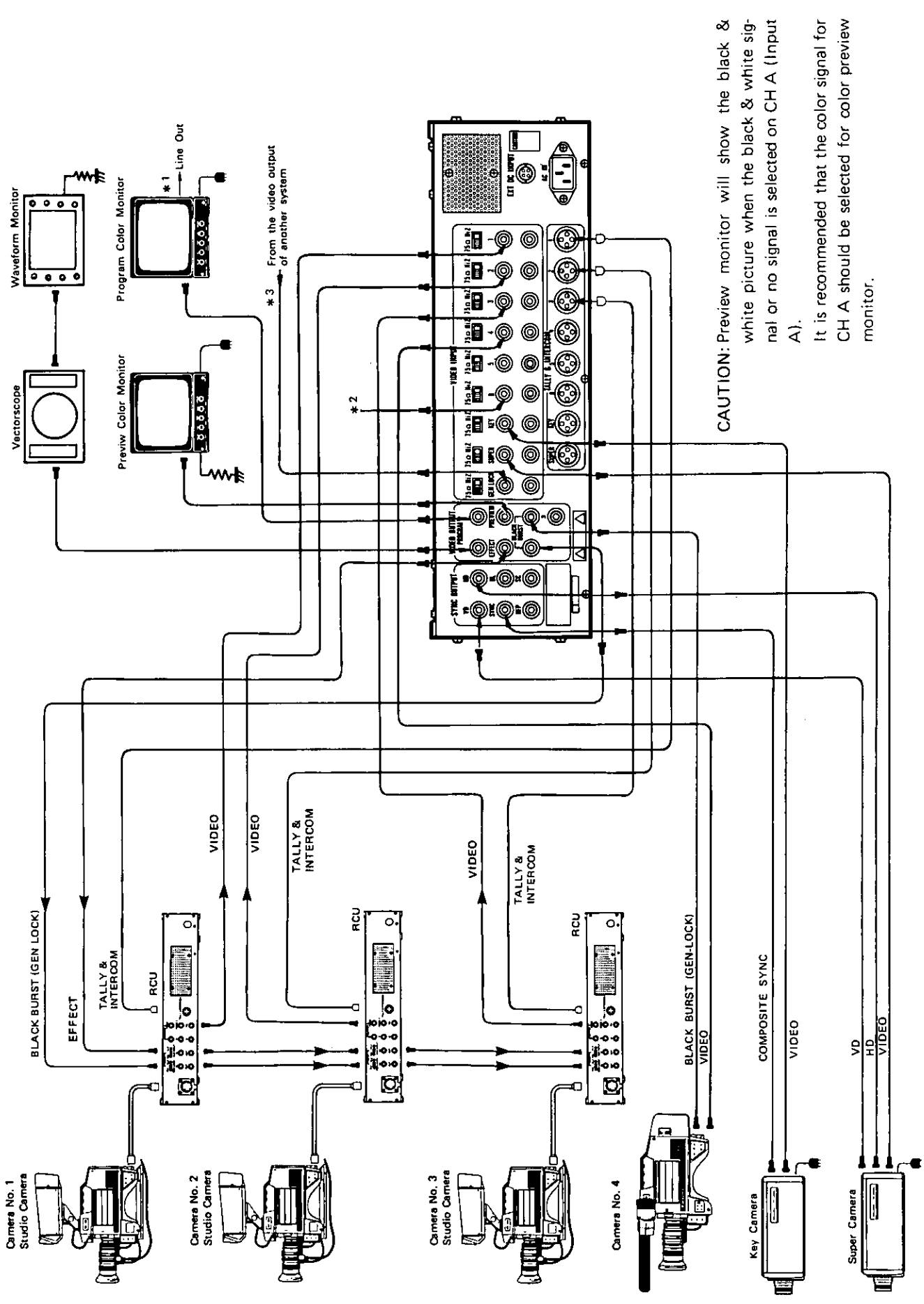
㊱ **Burst Flag Pulse Output Connector [ SYNC OUTPUT /BFP ]**
BNC type connector for BFP pulse.

㊲ **Subcarrier Output Connector [ SYNC OUTPUT/SC ]**
BNC type connector for SC signal.

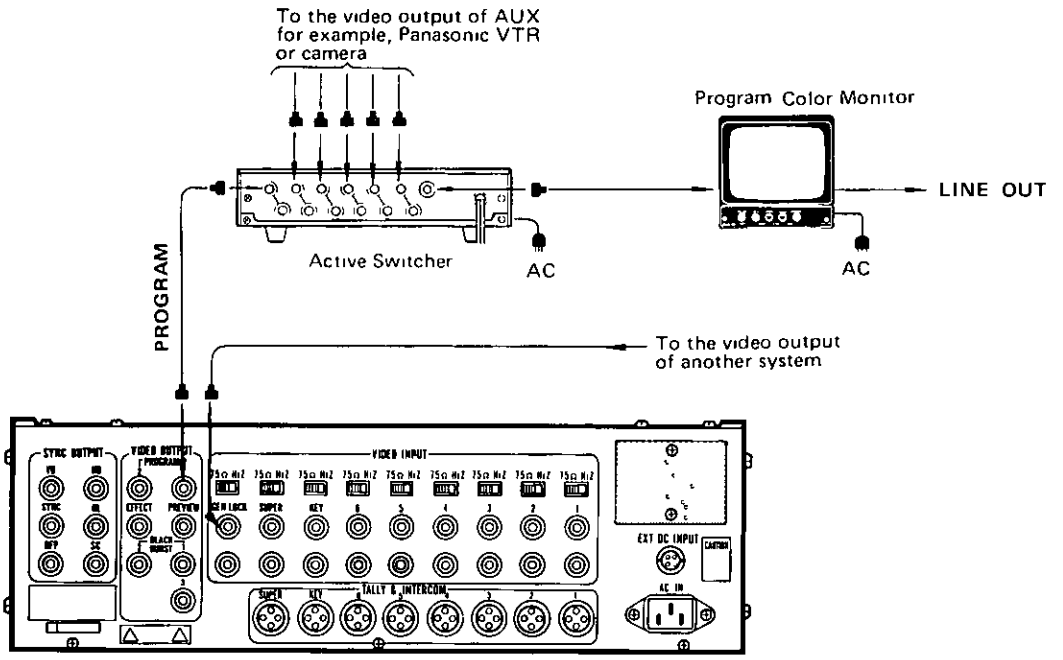
㊳ **Black Burst Output Connector [BLACK BURST]**
BNC type connectors for Black Burst signals.

㊴ **Power Supply Connector**

# SYSTEM CONNECTION



## * 1 System application with AUX video inputs




## * 2 NO 6 Video Input Connector

When using Fade in/Fade out, do not use this connector

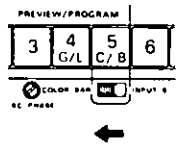
## * 3 Gen-lock

Video input signal should be composite Other video input signal may be either composite or non-composite

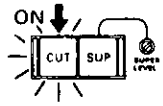
# SET UP PROCEDURE

- Connect the units as shown in the system connection diagram.

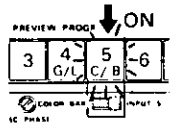
1. Phase Adjustment of the built-in Color Bar
   1) Set the Color Bar/Camera Selector ⑩ to the COLOR BAR position.



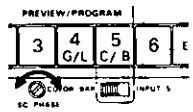

   2) Depress the Cut ON/OFF Switch ⑫ to place in the ON position.




   3) Depress the No. 5 button of the Preview/Program Selector ⑨.



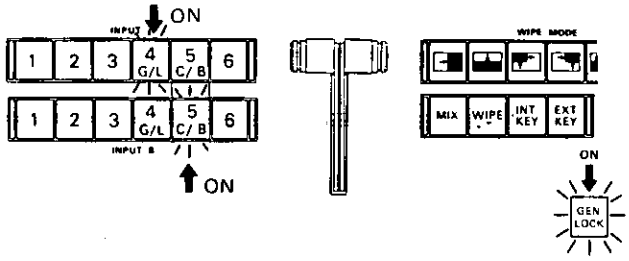

   4) Adjust the SC phase control of the color bar to align the correct hues on the Vectorscope.
   5) Adjust the phase control of the color bar to get the correct hues on the properly adjusted color monitor if a Vectorscope is not availabe.



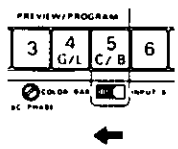

2. SC & H Phase Adjustment of Gen-Lock

**A. SC phase adjustment of Gen-Lock**

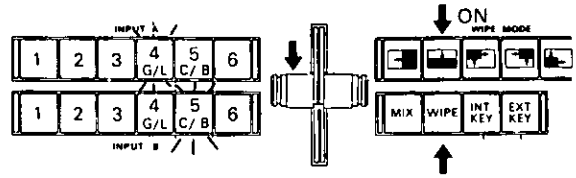
- **Procedure by using monitor**
   1) Connect the coaxial cable for gen-lock to gen-lock input connector ㉖.
   2) Select the No. 4 button on the Input A Selector ③ and No. 5 button on the Input B Selector ④. Then depress the gen-lock ON/OFF switch ⑮ to ON position.



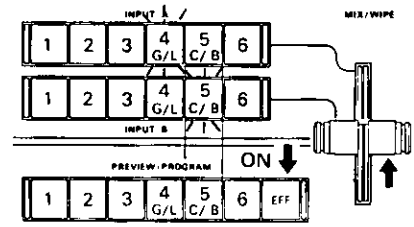

   3) Set the Color Bar/Camera Selector ⑩ to the Color Bar position.



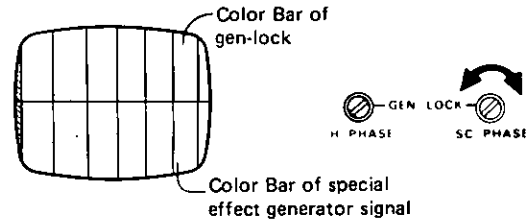

   4) Select the vertical wipe ▬ mode on the Wipe Mode Selector ⑥, the WIPE mode on the Function Selector ⑦ and set the Fade and Wipe Levers for EFFECT ⑤ in the middle.



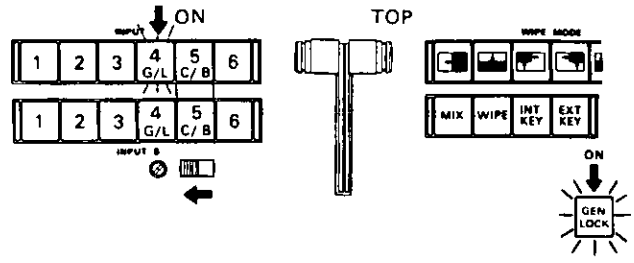

   5) Depress the EFF button of the Preview/Program Selector ⑨. Make sure that the Cut ON/OFF Switch ⑫ is OFF.




   6) Adjust the SC Phase Control ⑱ for GEN-LOCK to align the subcarrier phase of the color bar and the gen-lock input.




- **Procedure by using Vectorscope**
   1) Connect the program output signal ㉙ to vectorscope.
   2) Set the Color Bar/Camera Selector Switch ⑩ to Color Bar position.
   3) Select the No. 4 button on the Input A Selector ③ and set the Mix and Wipe levers ⑤ at top position. Then, depress the Gen-lock ON/OFF Switch ⑮ to ON position.

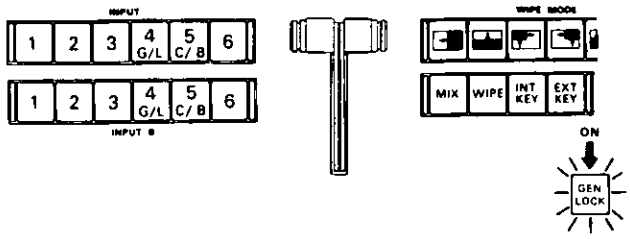



   4) Then, adjust the SC Phase ⑰. so that the chroma vectors of the program signal go into the ⊞ of vectorscope.

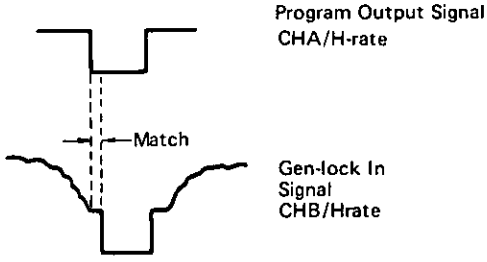
**B. H Phase Adjustment of Gen-Lock**

- **Procedure by using dual oscilloscope**

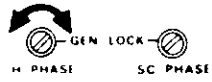
1) Connect CH A of oscilloscope at the Program Output Connector ㉙ and also connect CH B of oscilloscope at the Gen-lock Input Connector ㉖ .
2) Depress the Gen-lock ON/OFF Switch ⑮ to ON position and lamp lights when the gen-lock signal is connected.




3) Observe the waveform on the oscilloscope as;




4) Adjust the H Phase Control for the Gen-lock ⑰ to match the sync of both signals.

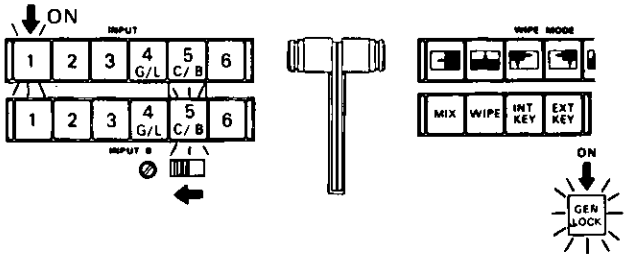



## ■ SYSTEM CAMERA

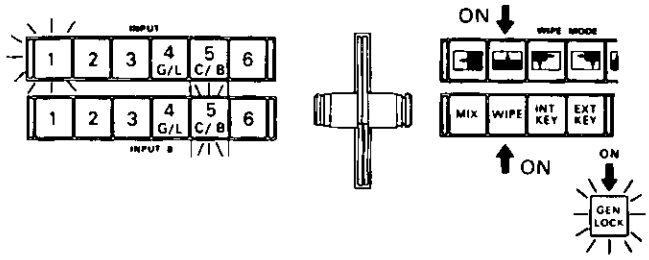
**1. SC Phase Adjustment of System Camera**

- **Set up procedure**

1) Set the Color Bar/Camera Selector Switch ⑩ to Color Bar position.
2) Select the No. 1 button on the Input A Selector ③ and No. 5 button on the Input B Selector ④.

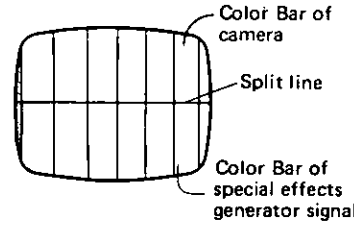



3) Select the vertical wipe mode on the Wipe Pattern Selector ⑥ , and set the Mix and Wipe levers ⑤ at middle position.




- **Procedure by using monitor**

1) Observe the program color monitor and adjust the SC Phase Control on the camera to match the hues.



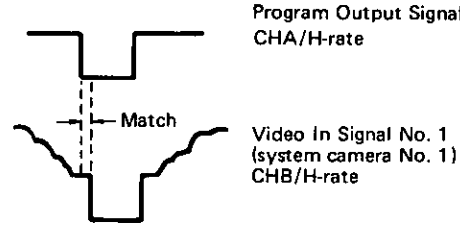

- **Procedure by using vectorscope**

1) Connect the program output signal ㉙ to vectorscope.
2) Adjust the SC Phase Control on the camera so that the chroma vectors of camera match to the chroma vectors of SEG.

**2. H Phase Adjustment of System Camera**

- **Procedure by using dual oscilloscope**

1) Connect CH A of oscilloscope at the Program Output Connector ㉙ and also connect the CH B of oscilloscope at the Video Input Connector ㉒ No. 1 (system camera No. 1 signal).
2) Observe the waveform on the oscilloscope as;




3) Adjust the H Phase Control of the camera to match the sync of both signals.

The same procedures are carried for the system cameras.

# OPERATION

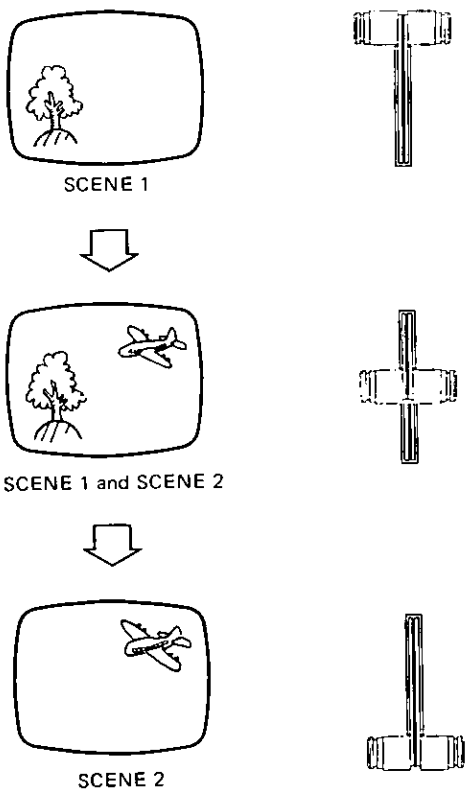
1. Make all necessary connections.
2. Turn on the color monitors.
3. Turn on the special effects generator.
4. Set up the special effects generator as described previously.

## Special Effects

### 1. Mix mode

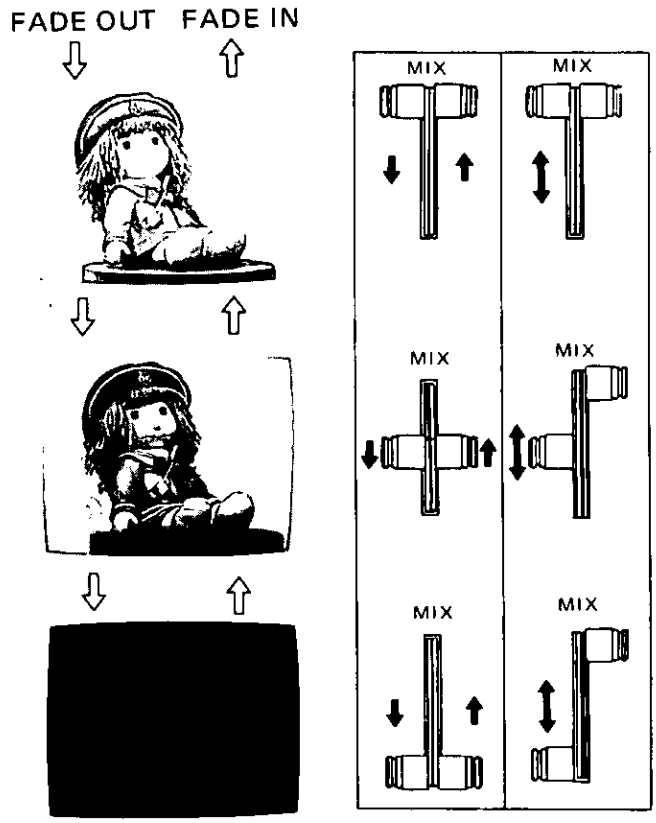
### A. Lap-dissolve

1) Depress the Cut ON/OFF Switch ⑫ to place in the ON position.
2) Select one input singal via the Input A Selector ③ and another via the Input B Selector ④.
3) Depress the MIX button on the Function Selector ⑦.
4) Watch the picture on the preview monitor.
5) Move both Mix and Wipe Levers ⑤ together from top to bottom or vice versa for a lap-dissolve.
6) Depress the Cut ON/OFF Switch ⑫ to place in the OFF position when the desired effect is achieved. It may be supplied to the line output [PROGRAM]




### B. Fading

1) Depress the Cut ON/OFF Switch ⑫ to place in the ON position.
2) To fade in the picture selected by Input A ③ selector, depress the No. 6 button of the Input B ④ which is not connected to any camera.
3) Move the Mix and Wipe Levers for EFFECT ⑤ simultaneously from bottom to top (or top from bottom).
4) Depress the Cut ON/OFF Switch ⑫ to place in the OFF position when the desired effect is achieved. The previewed fade effect can now be supplied to line output [PROGRAM].

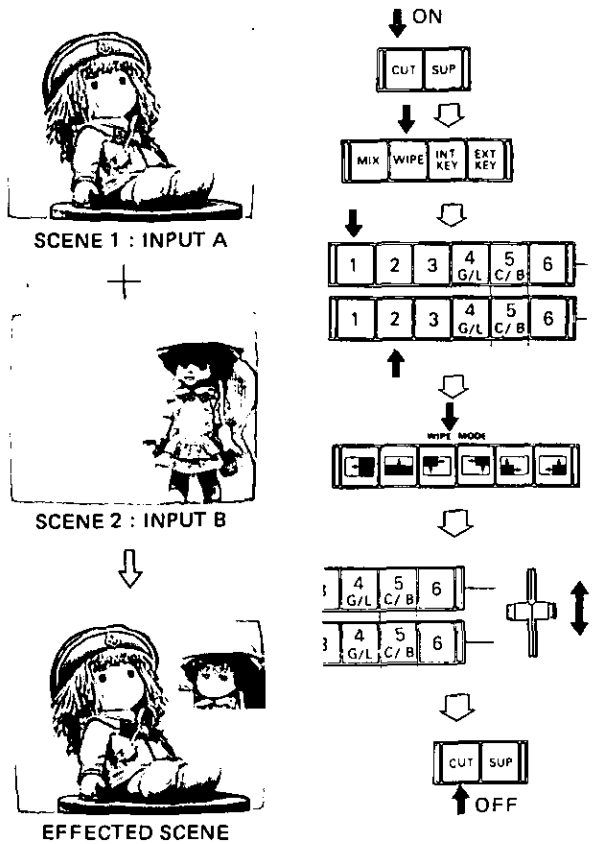



- Fade-in and fade-out can be obtained by separately operating the Mix and Wipe Levers for EFFECT ⑤. If both fade levers are in the up position, move the left of them downward for picture to fade out. If this lever is subsequently moved top, the picture will fade in.

### 2. Wipe mode

a) Six patterns can be selected with the Wipe Mode Selector ⑥.

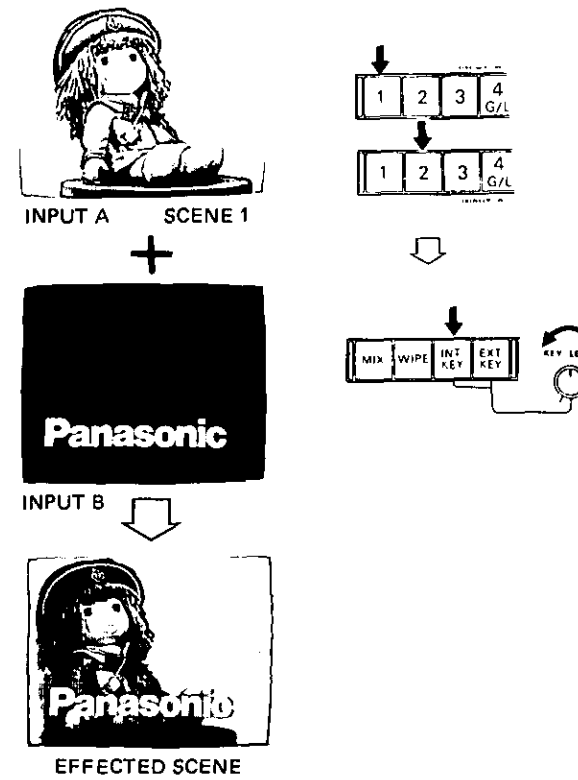
b) 1) Depress the Cut ON/OFF Switch ⑫ to place in the ON position.
2) Depress the WIPE button of Function Selector ⑦.
3) Choose one input at the Input A Selector ③ and another at the Input B Selector ④.
4) Depress the Wipe Mode Selector ⑥ in accordance with the desired wipe action.
5) Preview the wipe action by operating the Mix and Wipe Levers for EFFECT ⑤.
6) Depress the Cut ON/OFF Switch ⑫ to place in the OFF position when ready to supply the previewed wipe to PROGRAM out.




## 3 Key mode

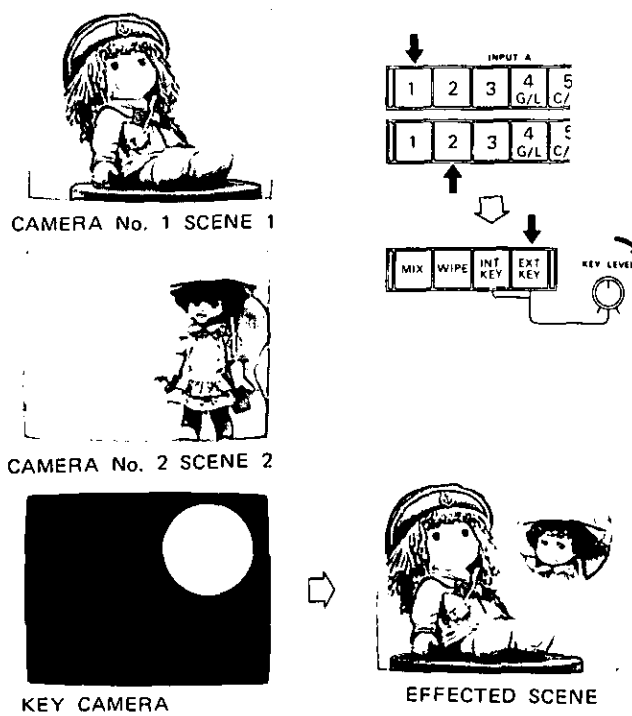
### a) Internal key

- If it is desired to key in the signal supplied by one of six cameras connected to Video Input Connectors ㉒.
  1) Select the picture which is to be keyed at the Input A Selector ③.
  2) Depress the proper button at the Input B Selector ④ to select the keying signal.
  3) Depress the INT KEY button on the Function Selector ⑦.
  4) Adjust the Key Level Control ⑧ for best results.




### b) External key

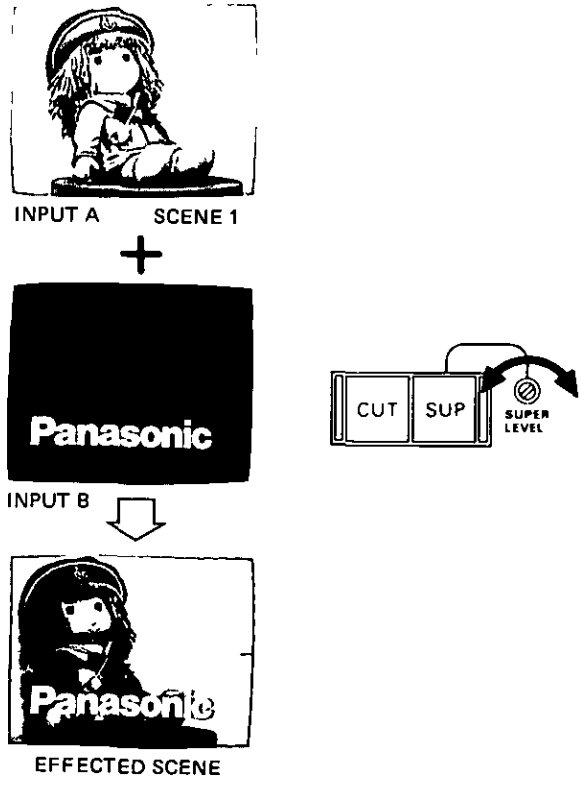
- The keying camera should be connected to the Video Input Connector for Key ㉔. For best results the keying signal should have high contrast, since the highlights of the signal are keyed into the Input A ③ and B ④ selected pictures.
  1) Depress the button at Input A ③ and B ④ Selectors.
  2) Depress the EXT KEY of the Function Selector ⑦.
  3) Adjust the key level with Key Level Control ⑧ for best result.



### c) Superimposing

- Connect the super input signal to the Video Input Connector for Superimpose ㉕ When the Super ON/OFF Switch ⑬ is turned ON, the superimposing singal will be superimposed onto the line signal Choose lighting and contrast so that the super input signal will be clearly superimposed onto the line signal If the input signal level cannot be controlled adjust the Super Level Control ⑭

  1) Depress the Super ON/OFF Switch ⑬ to place in the ON position
  2) Adjust the super level with the Super Level Control ⑭



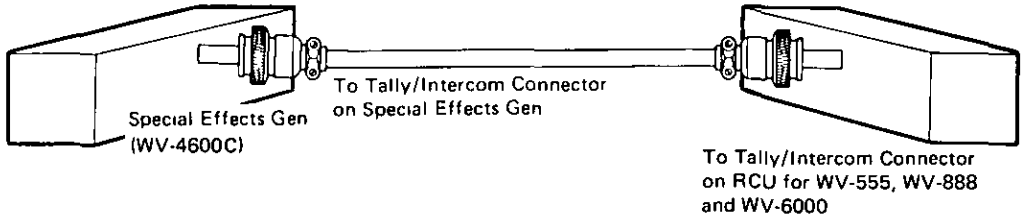

## TALLY AND INTERCOM CONNECTIONS

When connecting the tally and intercom circuits of your Special Effects Generator (S E G) model No WJ-4600C with your Panasonic Color Cameras such as WV-555, WV-888 and WV-6000, following connection is required

**Instruction for connection**

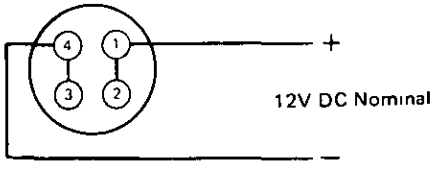
With Color Cameras

1 Solder a 4 pin Tally/Intercom plug (YQAAA-33) to each end of a 4-Conductor Cable
2 Connect the cable as follows




## EXTERNAL DC INFORMATION

The special effect generator receives external DC power The 4P connection for external DC power source is shown as,




CAUTION Use only with a 12V DC power supply marked class 2
Do not use with an external storage battery unless provided with a fuse rated at 8 amps or less and located within 5 inches of the battery connecting means

# SPECIFICATIONS

| | |
|---|---|
| Video Input: | 1.0Vp-p composite or 0.7Vp-p non-composite/75 ohms or Hi-Z looping through x 6 (BNC connectors) |
| Key Video Input: | 1.0Vp-p composite or 0.7Vp-p non-composite/75 ohms or Hi-Z looping through x 1 (BNC connector) |
| Super Video Input: | 1.0Vp-p composite or 0.7Vp-p non-composite/75 ohms or Hi-Z looping through x 1 (BNC connector) |
| Gen-lock Video Input: | 1.0Vp-p composite /75 ohms or Hi-Z looping through x 1 (BNC connector) |
| Video Output: (Program): | 1.0Vp-p composite/75 ohms x 2 (BNC conectors) |
| Preview Output: | 1.0Vp-p composite/75 ohms x 1 (BNC conector) |
| Effect Output: | 1.0Vp-p composite/75 ohms x1 (BNC conector) |
| Sync Output: | HD, VD, BL, SYNC, BFP: 4.0Vp-p/75 ohms SC;2.0Vp-p/75 ohms (BNC connectors) |
| Black Burst Output: | (Composite Sync, Burst : 40 IRE set up 7.5 IRE/75 ohms) x 3 (BNC connectors) |
| Gen-lock Range: | Sync : 15.734 kHz ± 120 Hz SC : 3.579545 MHz ± 100 Hz |
| Color Bar Signal: | Built-in |
| Switch: | Illuminated, non-locking (input buses, preview/program buses) and lock-release type |
| Switching: | Vertical interval switching (input buses, preview/program buses) |
| Frequency Response: | 10MHz $^{+1}_{-3}$ dB |
| Gain: | Unity |
| Signal to Noise Ratio: | More than 60dB |
| Differential Gain: | Less than 2% at 10 ~ 90% APL |
| Differential Phase: | Less than 2° at 10 ~ 90% APL |
| Crosstalk: | Better than 45dB at 3.58MHz |
| Function: | |
| Input Bus: | Input A and B (camera 1, 2, 3, 4 or gen-lock video, 5 or color bar, 6 or black) |
| Preview/Program Bus: | Camera 1 ~ 3, 4 or gen-lock video, 5 or color bar, 6 or black, Effect |
| Effects: | |
| Fading: | Yes |
| Dissolves: | Yes |
| Superimposing: | Yes |
| Wipes: | Normal-reverse mode, with six patterns: |
| Internal Key: | Yes |
| External Key: | Yes |
| Genlock (VTR Mixing): | Yes |
| Tally Light Control: | 8 (camera 1 ~ 6, key camera, super camera) |
| Intercom: | 7 (camera 1 ~ 6, self) |
| Power Source: | 120V AC 60 Hz 29W or 12V DC 1.2A |
| Ambient Temperature: | 14°F ~ 122°F (- 10°C ~ +50°C) |
| Ambient Humidity: | Less than 90% |
| Dimensions: | 19" (W) x 5-1/4"(H) x 5-7/8" (D) |
| Weight: | 14-1/4 lds, 6.5kg |

Specifications are subject to change without notice. Weights and dimensions shown are approximate.

# STANDARD ACCESSORIES

- 4-pin connector (YQAAA-33) for Tally & Intercom ..... 8 pcs.
- Lamp (YW6200120500) ..... 2 pcs.
- Indication card (YWJ5500UR02) ..... 1 set
- Extension board (YWJ5500ZK13) ..... 1 pc.
- AC power cord (33-892M) for U.S.A. ..... 1 pc.
- AC power cord (33A-89A2M) for Canada ..... 1 pc.
- Rackmount angle (YWV8250AM20) ..... 2 pcs.
  [Rack handle (YWB350-HM01) ..... 2 pcs.]
- 4-pin connector (YWRM12BPG4S) for EXT DC Input ..... 1 pc.

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